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ABSTRACT

Information systems are a necessary, but not sufficient, condition for improving the efficiency of educational systems. Improving the Education Management Information System must be the foundation of any long-term effort to enhance the efficiency of the Nepalese system. Three critical conditions must be met to enhance system efficiency (effectiveness compared with costs): (1) quality of the data must be ensured; (2) to become information, the data must be meaningful for those receiving it; and (3) information must have institutional channels for use in decision-making. Developing regular channels is difficult because persons or agencies may see no advantage in using the information or may perceive that it erodes their influence. Information may also be discounted because it contradicts other information or is difficult to incorporate given poorly developed decision-making processes. Even small investments in computer hardware and training can help overcome these limitations by ensuring that information is provided at critical moments in the decision-making process and by developing advocates of information use within decision-making institutions. Important steps have been taken, or can be, that meet the information needs of the Nepalese educational system. (TEJ)

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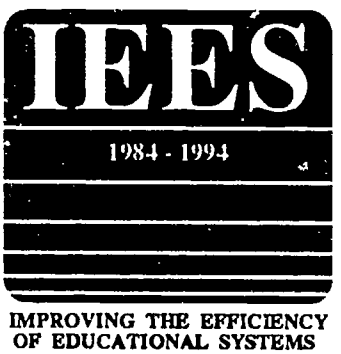

A USAID Project

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BUILDING AN INFORMATION SYSTEM FOR EFFICIENCY IMPROVEMENT

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A paper presented at the National Seminar on
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Let me first express my appreciation—and the appreciation of IEES and USAID—to Madhup Dunghana and to the many Ministry of Education and Culture (MOEC) officials who have contributed to this research effort. The impacts of the research findings—which have just been so well described—have been realized because of the support of many educators here today. Assisting for two years on this study has been a rewarding experience for me.

For my part, I would like to present an overview of IEES experience in assisting countries with the development of information systems and to discuss the next steps for strengthening the Education Management Information System (EMIS) in Nepal.

As you know, IEES has sponsored research studies in other countries similar to the one in Nepal in order to examine the availability and accuracy of educational information, its flow through the educational system, how it is (or is not) utilized, and how decisionmakers feel about their use of information. In addition to such research on information use, IEES continues to assist many countries in building information systems. As in Nepal, this is necessarily a slow process and one that requires the strong and sustained support of ministry decisionmakers.

To begin with, I would like to address a central question: Why does IEES assist in developing information systems and sponsor research in this area? Discussions in this seminar have focused on the need to affect change at the classroom level and those of us

representing IEES/USAID here have stressed our concern of targeting project resources on such changes. We recognize the need to operate not only at ministry level, but also at the classroom/school/district level where the actual delivery of education and training services are concentrated. After all, if the investments of MOEC, IEES, and other assistance agency resources resulted only in more efficient central level operations – but produced no significant changes in the classrooms of Nepal – then little would have been achieved. External assistance fails when it isolates itself from the reality of the education context in Nepal – or in any country – and focuses only on work with central officials at the national level. The IEES planning model is always built upon the idea of linking school level realities with central policy deliberations.

Simply put, the strategy for IEES assistance is based on the belief that information systems are a necessary – but not sufficient – condition for improving the efficiency of an educational system. That is, an information system will not bring about improved efficiency, but it is one in the set of conditions which is most likely to bring about efficiency improvements. IEES strategy argues that EMIS development must be the foundation for any long-term restructuring of policy emphases concerning human resource efficiency. We have continued to stress, however, when assisting in the building of information systems, that an EMIS will not, by itself, produce better analysis and decisionmaking. The EMIS research in Nepal which has been described today, along with the findings of the IEES-sponsored EMIS research in Somalia and Yemen Arab Republic, has now given us a better understanding of the linkages between information needs, data availability, hardware and software needs, technical training needs, and the development of an organizational culture within which data-based decisionmaking is not only accepted, but is required. The IEES monograph on **Indicators of Educational Effectiveness and Efficiency** provides an overview of how an efficiency-based EMIS could be built and we would be pleased to provide copies of this monograph to each of you.

Again, let me note how IEES operationalizes the efficiency concept. System efficiency is defined by its effectiveness (which subsumes concerns of quality, equity and access)

when compared with the costs of achieving this effectiveness. Indicators of system effectiveness must, therefore, be collected in order to be compared with costs.

IEES experience in assisting education ministries plan and implement information systems has taught that there are three critical conditions which must be met before such systems can effect the efficiency of the education system. First, the quality of the data collected must be assured. That is, the accuracy, timeliness, and availability of data must be at a level to justify the confidence of ministry decisionmakers. In some countries, we have found that decisionmakers lacked confidence in the data collected by ministry systems—the result of years of receiving out-of-date and inaccurate data. The absence of computers in some systems led to tabulation errors compounded at every level and long delays in even basic summaries of educational data.

Conversely, The arrival of computer-based systems has sometimes lead to the overestimation of their power. The greatly increased speed and tabulation accuracy of computer-based systems may cause educators to ignore data quality issues due to systemic reporting and collection problems.

As the MOEC EMIS study in Nepal found, errors in tabulating and reporting data by the Manpower and Statistics Division are minor and decisionmaker confidence in the data collected is justified. The study reports, in fact, that the amount of error is even less than decisionmakers believe it to be.

The second critical condition for data systems leading to efficiency improvements is that data must become information. Let me emphasize this important distinction between data and information: data becomes information when it has meaning for those receiving it. Numbers on enrollments, repetitions, dropouts, etc. must be analyzed and interpreted to become useful information for guiding rational policymaking.

The availability of reliable and relatively cheap microcomputers since 1981 (the introduction of the IBM PC) has resulted in the production of volumes of data summaries and analyses from the jungles of Liberia to the deserts of Somalia and the valleys and mountain peaks of Nepal. All this data is useless unless it has meaning for those who must make resource allocation decisions at all levels of the system. Easily-learned off-the-shelf software for statistical summary and analysis has also contributed to this explosion

of data. The offices of the world are now being filled with daily printouts from Lotus 1-2-3, dBase III, Enable, and other well-known software packages.

IEES continues to stress, however, that data analysis is not a mechanistic process. Machines do not produce information from data. The process in necessarily subjective in nature. The values important to those using data for preparing arguments for policy change must enter (explicitly or implicitly) into the process of changing data into information. The important point here is that decisions will and must be made—with or without data-based information. The goal of an information system is simply to improve this process.

The third condition to be met in order to affect system efficiency improvements is that information must have regular channels to flow into institution decisionmaking processes. That is, the products of the information system must be clearly, concisely, and persuasively presented and regularly introduced into existing institutional channels. This condition is, of course, the most difficult of all the three to attain.

Many factors may combine to hinder the introduction of information into decisionmaking channels. Some of these which IEES has encountered are:

- Those persons or agencies accustomed to decisionmaking without the provision of data-based information may see no advantage in using the information.
- Decisionmakers may, in fact, perceive that their influence could be eroded through data-based arguments. Accurate and timely information may contradict their beliefs about the system.
- Information produced within the ministry may be in conflict with other (government or external assistance agency) strategies or interests and thus may be devalued or discounted.
- The decisionmaking process may not be overtly defined and thus may be unable to accept the information produced. This may be either because the processes within the ministry are not regularized or because the important decisions affecting the work of the ministry actually are made outside the ministry.

IEES experiences in assisting ministries to develop information systems have taught that information is most likely to flow into decisionmaking channels under these conditions:

1. The information provided by the new system becomes available at key decisionmaking or planning points. That is, the perceived value of the

information being produced (and, by extension, the value of past and future investments in the system) is recognized because it can provide data-based arguments at the crucial points of debate. This has occurred in some countries when the new system provided useful information when it was needed to feed into ministry internal reviews, government planning cycles, or important project planning stages of agencies assisting the ministry.

Information produced by the new system becomes implicitly powerful when it feeds into such points of debate because it is able to move policy debate from personal intuitions and beliefs and towards more rational comparisons of both what is known (collected data) and what is yet unknown (projected data).

2. Secondly, IEES experience has been that information use in institutions which are unaccustomed to data-based debate requires strong advocates within that institution. Information use in organizations requires champions within the existing hierarchy to introduce relevant, useful, and persuasive information into policy debate.

The technical nature of building a computer-based information system presents a special problem for introducing information into policy debates. The danger is that the system will be seen by the institution only as a technical innovation. Its products will be admired, but not used and its advocates—unless highly placed—will be confined to the level of technicians. Information, even though of high quality and however well-presented, may have no effect on system efficiency.

IEES as one of its four central component activities (I refer you to the project description handout) assists ministries of education with the development of information systems because the opportunity for efficiency impacts are great. Our experiences have shown that even quite small investments in hardware and training can result in impacts on system efficiency far beyond what one might expect from comparable investments. Clearly, the opportunity for such impacts is now present in Nepal. The first of the critical conditions I have described is being met: The quality of data being collected is of sufficiently high quality to be acceptable for use by ministry decisionmakers. The remaining conditions to be met are:

- the regular transformation of data into information, and
- the institutionalized use of that information in policy forums.

Creating the opportunity for these conditions will require both time and strong advocacy by those who strive to improve primary education in Nepal today.

Let me conclude with a brief overview of the next steps for developing an information system in Nepal. These have been put forth in the MOEC proposal for EMIS development (copies of which have been provided to you). These steps include:

- Reduction of the present redundancies in MOEC data collection systems;
- Further strengthening of the Manpower and Statistics system within the MOEC;
- Building the analysis capacity within the system for the timely dissemination of needed information; and
- The identification of appropriate effectiveness indicators for the system.

In the future, this system should be built upon the specification of effectiveness indicators which can, when compared to costs, provide needed information on the performance of subcomponents of the educational system in Nepal. In this important work, IEES and USAID remain committed to assisting the MOEC and all concerned educators in Nepal.

Summing up, let me say that today information use to achieve efficiency improvements is possible in Nepal and – in fact – important steps have been taken towards this goal. The continued work and the support of the educators who are here today is required. The present EMIS can be developed to meet the information needs of the Basic Needs Initiative and other programs in Nepal to which the MOEC is pledged. Strong advocacy for information dissemination and use is essential and – given the support shown in this seminar – will continue in coming years.